Lesson 4: Controlling Memory with Variables

Adapted from code.org curriculum

Objectives:

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- Use variables in a program to store numeric values.
- Store the value returned by a function (randomNumber, promptNum) in a variable for use in a program.
- Debug problems related to variable re-assignment.
- Write arithmetic expressions that involve variables.
- Reason about multi-line segments of code in which variables are re-assigned multiple times.

So far…

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- You know how to add UI elements, give them meaningful IDs, and how to add event handlers
- Moving forward:
  - We will learn how to control the computer's memory to remember things while the program is running
  - Most apps keep track of some info that changes and updates as you use the app (ex: score in a game)
  - App Lab already keeps track of some things in memory by default (position of a UI element) but sometimes we want control over some memory

Activity: Controlling Memory with Variables

 The programming tasks in this lesson acquaint you with basics of working with variables and building up a mental model for how programs use and manage memory.

 To keep things simple, the output will mostly be simple text displayed to the app screen or debug console

Video

Two misconceptions:

The = sign in programming is an instruction to store a value in memory, NOT a statement of equality.

"Variables" in computer programming are just named pieces of memory, NOT unknowns in an equation or symbols for undetermined values.

Wrap-up:

- Now that you've had a fair amount of practice working with the basic mechanics of variables, and learning how to debug your own problems, you're more than ready to start using variables in apps.

- This lesson is subtly one of the most important for you as a programmer. Being able to answer questions like the last multiple choice question in the lesson on Code Studio means that you have a good mental model for how programs execute code and how machines work.

- Some research has shown that being able to answer questions about simple variable re-assignment correlates highly with doing well in programming overall. So you're on your way!